MCR225FP Series

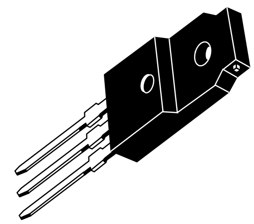
Silicon Controlled Rectifiers

Reverse Blocking Thyristors

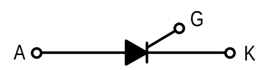
. . . designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supply crowbar circuits.

- Glass Passivated Junctions with Center Gate Fire for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Constructed for Low Thermal Resistance, High Heat Dissipation and Durability
- Blocking Voltage to 800 Volts
- 300 A Surge Current Capability
- Insulated Package Simplifies Mounting

ISOLATED SCRs
25 AMPERES RMS
600 thru 800 VOLTS



CASE 221C-02
STYLE 2



MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage(1) (T_J = –40 to +125°C, Gate Open) MCR225-8FP MCR225-10FP	V_{DRM} V_{RRM}	 600 800	Volts
On-State RMS Current (T_C = +70°C) Full Cycle Sine Wave 50 to 60 Hz(2)	$I_{T(RMS)}$	25	Amps
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, T_C = +70°C) Preceded and followed by rated current	I_{TSM}	300	Amps
Circuit Fusing (t = 8.3 ms)	I^2t	375	A^2s
Peak Gate Power (T_C = +70°C, Pulse Width = 10 µs)	P_{GM}	20	Watts
Average Gate Power (T_C = +70°C, t = 8.3 ms)	$P_{G(AV)}$	0.5	Watt
Peak Gate Current (T_C = +70°C, Pulse Width = 10 µs)	I_{GM}	2	Amps
RMS Isolation Voltage (T_A = 25°C, Relative Humidity ≤ 20%)	$V_{(ISO)}$	1500	Volts
Operating Junction Temperature Range	T_J	–40 to +125	°C
Storage Temperature Range	T_{stg}	–40 to +125	°C

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.
2. The case temperature reference point for all T_C measurements is a point on the center lead of the package as close as possible to the plastic body.

REV 1

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	°C/W
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2 (typ)	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward Blocking Current (V_D = Rated V_{DRM}, Gate Open) T_J = 25°C T_J = 125°C	I_{DRM}	— —	— —	10 2	μA mA
Peak Reverse Blocking Current (V_R = Rated V_{RRM}) T_J = 125°C	I_{RRM}	—	—	2	mA
Forward "On" Voltage(1) (I_{TM} = 50 A)	V_{TM}	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) (Anode Voltage = 12 Vdc, R_L = 100 Ohms)	I_{GT}	—	—	40	mA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 12 Vdc, R_L = 100 Ohms)	V_{GT}	—	0.8	1.5	Volts
Gate Non-Trigger Voltage (Anode Voltage = Rated V_{DRM}, R_L = 100 Ohms, T_J = 125°C)	V_{GD}	0.2	—	—	Volts
Holding Current (Anode Voltage = 12 Vdc)	I_H	—	20	40	mA
Turn-On Time (I_{TM} = 25 A, I_{GT} = 40 mAdc)	t_{gt}	—	1.5	—	μs
Turn-Off Time (V_{DRM} = Rated Voltage) (I_{TM} = 25 A, I_R = 25 A) (I_{TM} = 25 A, I_R = 25 A, T_J = 125°C)	t_q	— —	15 35	— —	μs
Critical Rate-of-Rise of Off-State Voltage (Gate Open, V_D = Rated V_{DRM}, Exponential Waveform)	dv/dt	—	100	—	V/μs

1. Pulse Test: Pulse Width = 1 ms, Duty Cycle ⩽ 2%.

TYPICAL CHARACTERISTICS

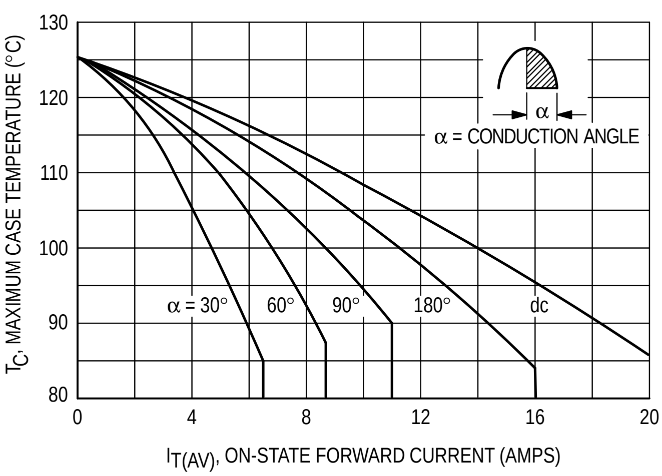


Figure 1. Average Current Derating

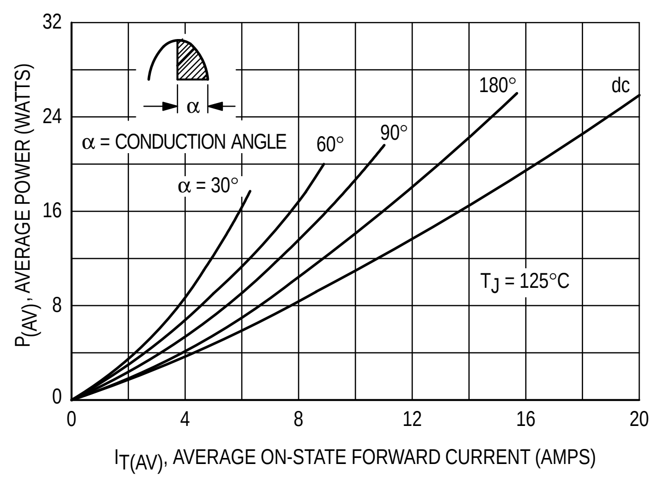


Figure 2. Maximum On–State Power Dissipation

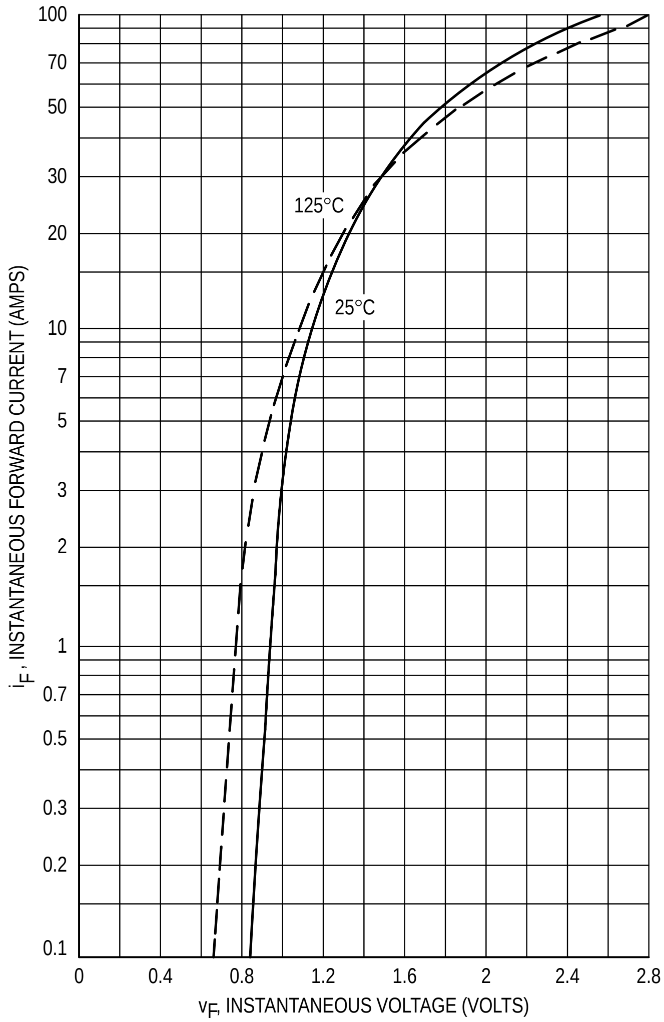


Figure 3. Maximum Forward Voltage

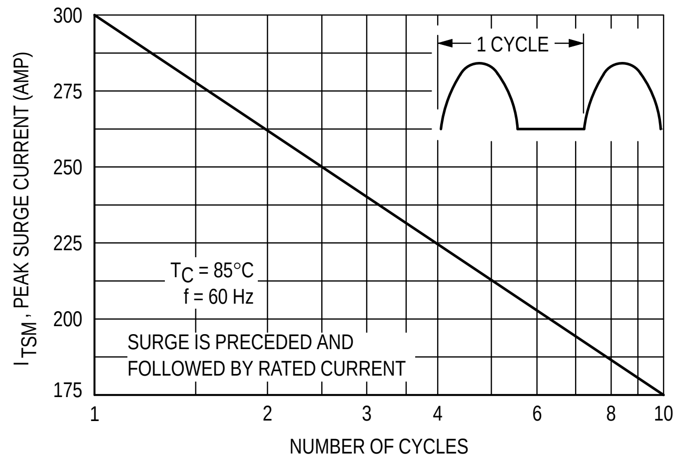


Figure 4. Maximum Non-Repetitive Surge Current

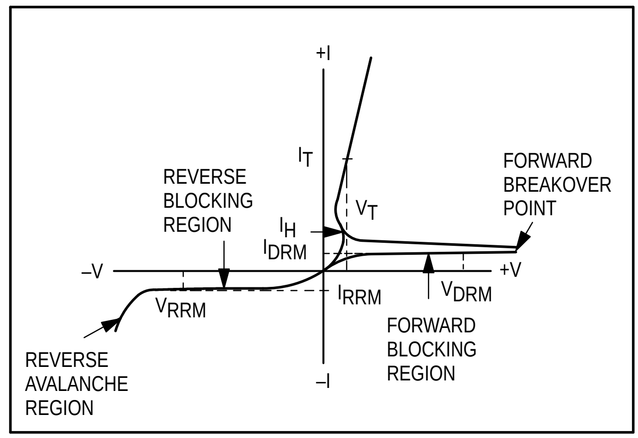


Figure 5. Characteristics and Symbols

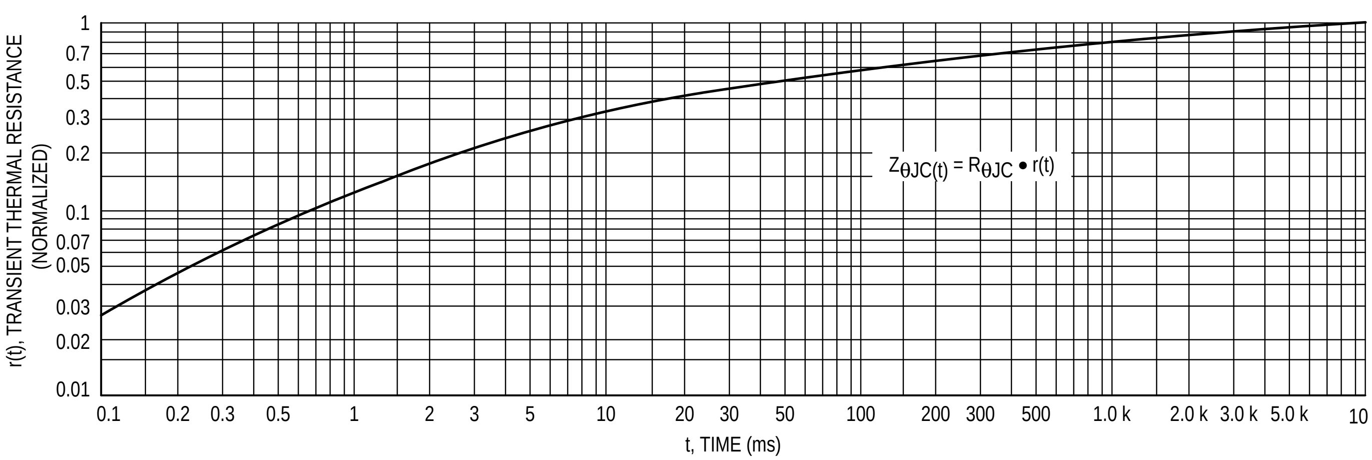


Figure 6. Thermal Response

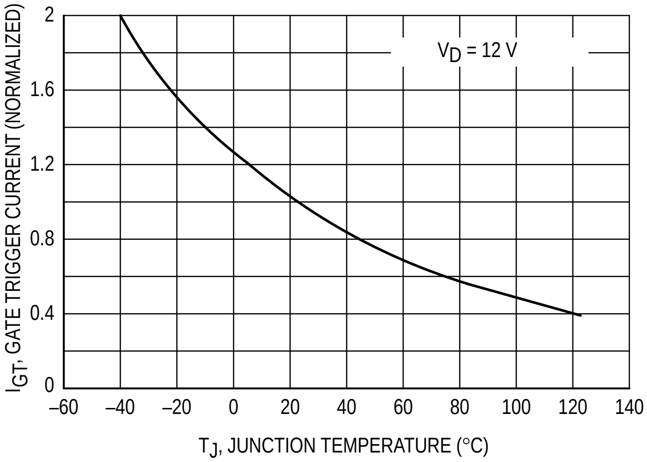


Figure 7. Gate Trigger Current versus Temperature

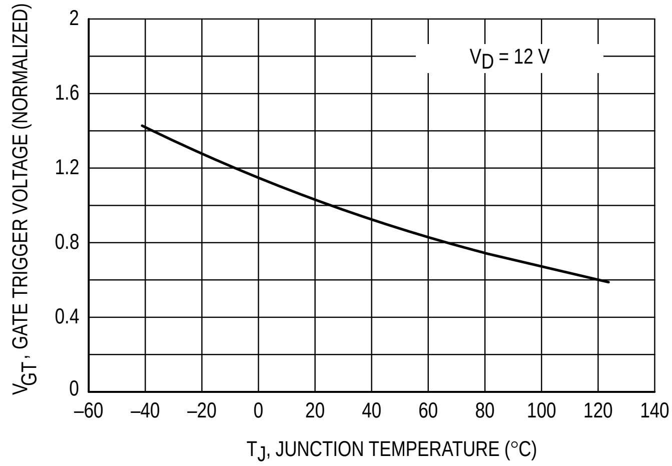


Figure 8. Gate Trigger Voltage versus Temperature

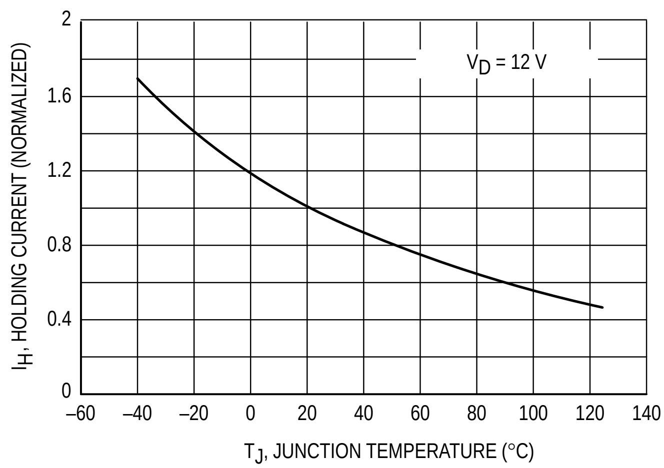
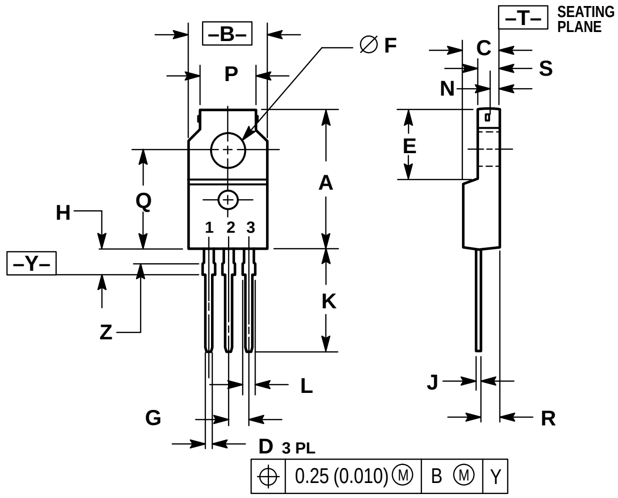


Figure 9. Holding Current versus Temperature

PACKAGE DIMENSIONS



STYLE 2:
PIN 1. CATHODE
2. ANODE
3. GATE

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.680	0.700	17.28	17.78
B	0.388	0.408	9.86	10.36
C	0.175	0.195	4.45	4.95
D	0.025	0.040	0.64	1.01
E	0.340	0.355	8.64	9.01
F	0.140	0.150	3.56	3.81
G	0.100 BSC		2.54 BSC	
H	0.110	0.155	2.80	3.93
J	0.018	0.028	0.46	0.71
K	0.500	0.550	12.70	13.97
L	0.045	0.070	1.15	1.77
N	0.049	—	1.25	—
P	0.270	0.290	6.86	7.36
Q	0.480	0.500	12.20	12.70
R	0.090	0.120	2.29	3.04
S	0.105	0.115	2.67	2.92
Z	0.070	0.090	1.78	2.28

CASE 221C-02
ISSUE B

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